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REGIONAL CHANGES IN EGG PRODUCTION

By Herman Bluestone

Over the last decade or so, egg production has not kept pace with population growth mainly because the demand for eggs has been declining. At the same time, egg production has been limited because of relatively more attractive economic opportunites for people in other lines of agriculture and in nonfarm pursuits. The 24 percent increase in population between 1947-49 and 1961 has been accompanied by only an 11 percent rise in farm egg output, despite declining prices for eggs and rising per capita incomes.

Egg Production Shifts From the Midwest to the Southeast and the West

All regions did not share equally in the larger egg production. Output expanded at several times the national rate in the South Atlantic and Western regions and declined significantly in the North Central Region. These changes brought about a substantial shift in the regional distribution of egg production in the United States.

In 1947-49, the North Central Region produced half of the Nation's eggs, but by 1961 these regions accounted for only 40 percent of the U. S. total. During the same interval the South Atlantic Region's share of the U. S. market expanded from 9 to 14 percent and the Western Region's from 10 to 15 percent. Relatively little change occurred in the South Central Region.

The West North Central Region is sometimes called the egg basket of America because on a per capita basis it turns out about 3 to 5 times as many eggs as any other region. It still supplies eggs to all other regions, at least during certain times of the year. However, the regional changes in egg production since 1947-49 have greatly reduced the need for "imported" eggs in the South Atlantic and Western States. Per captia egg production in the South Atlantic Region reached 317 in 1961, compared with 235 in 1947-49 and in the West expanded from 302 to 320.

In the East North Central Region egg production per capita dropped from slightly above the U. S. rate in 1947-49 (384 eggs compared with 380) to significantly below the U. S. rate in 1961 (278 eggs compared wtih 335 eggs). In the North Atlantic and South Central Regions the fall-off in eggs produced per capita was less than for the country as a whole which suggests that the declines here may have been due primarily to the reduced demand for eggs rather than to more intense competition from other regions.

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Many Factors Influence Regional Changes in Egg Production

Where eggs are produced and in what amounts are determined principally by three considerations: the cost of production, the price received for eggs, and alternative economic opportunities. There are also other bases for the location of production which might be summed up by the phrase "the attraction of egg production as a way of life". The other considerations, however, have become less important in recent years as the scale of production has increased and cost-price margins have narrowed.

Behind the increases in egg production in the South Atlantic States and the West lie some similar developments. First, the population in these two areas have been expanding much more rapidly than in the other regions; this has been particularly true in the West, where the number of people increased more than twice as fast between 1948 and 1961 than in the country as a whole. Furthermore, the shift to large commercial egg farms has been proceeding at a faster pace in these two areas. The greater purchasing power of these large-scaled enterprises has helped to lower feed costs, thus offsetting in part the natural advantage of the grain belt.

In addition the South Atlantic Region was an egg deficit area, producing only about 235 eggs per person in 1947-49 compared with the national average of 380. This meant that production could be substantially increased without significantly lowering the price relative to other areas, since the increased output merely replaced eggs formerly shipped in from the Midwest. In other words, the price of eggs in the Southeast essentially remained above those in the Midwest by roughly the cost of transporting eggs between the two regions. Now that the South Atlantic Region has become relatively much more self-sufficient in eggs, further expansion in output will most likely proceed at a much slower rate. Eggs in excess of local needs have to be sold at distant markets and this means that prices must adjust downward to reflect the extra transportation costs. The considerations also apply to the West but to a lesser extent.

There were also a number of other important factors which encouraged the growth in egg production in the South Atlantic Region. The rapid expansion of the broiler industry played a vital role. It was accompanied by the development of specialized service and marketing facilities which could be easily adapted or supplemented to meet the needs of egg producers. It also encouraged local broiler hatching egg flocks, thereby helping to introduce the area to larger-scaled egg production. As broiler production became relatively less profitable it was only natural for the integrators and financiers who were responsible for the phenomenal growth of the broiler industry to turn their attention to table egg production. The egg industry, of course, also enjoys the same cost advantages as the broiler industry. Of particular importance was the reduction

in feed costs relative to other areas made possible by the navigational improvements over the last 15 years or so in the inland waterways that tie the Southeast to the surplus corn producing States of the Midwest. The TVA development of the Tennessee River was particularly important in this regard. Then, too, a lack of satisfactory economic alternatives for a large rural popopulation was an important factor.

The South Catches Up
With the Nation in Eggs Per layer

Much of the regional difference in egg production per layer has disappeared over the last decade. There has been a persistent uptrend in the productivity of layers in all areas of the country, but gains have been substantially greater in the South, where rates of lay were formerly much below the U.S. average. Between 1947-49 and 1961, the number of eggs produced per layer increased 42 percent in the South Atlantic Region and 40 percent in the South Central Region, compared with 23 to 26 percent gains in the other regions. In 1961, output per layer in 4 out of the 6 geographic regions fell within 2 percent of the U. S. average. Only in two regions does egg production per layer still deviate significantly from the U. S. rate. In the South Central Region, it averaged about 8 percent below the U. S. average last year and in the Western Region it averaged 6 percent above.

The situation in 1961 represents a significant change from 1947-49. In this earlier period, egg production per layer in the South Central and South Atlantic Regions was below the U. S. average by 16 and 11 percent while in the North Atlantic Region it was 12 percent above. (See table 25).

Gains in egg production per layer have been the result of a number of developments which fall under the broad headings of improvements in genetics, nutrition, disease control, and management. Since these factors are closely intertwined, it is quite difficult to measure separately the impact of each. However, improved management has been a catalytic agent behind the rapid adoption of the latest developments in technology and therefore behind the rapid rise in eggs per layer. It has been an important factor in all areas of the country over the last decade, but it has had the most noticeable impact in the South. The level of management tends to be closely related to the size of the egg enterprise. When egg production is carried on as a side line, mostly for home consumption or to provide the farmer's wife with pin money, there is a less compelling need or incentive for good management because the egg interprise generally provides only a small part of total farm income.

However, the advantage to large specialized egg-producing farms in adopting the latest technology is great. For those already in business, the pressure to use the most advanced techniques has become more intense over the last decade as profit margins have narrowed. Larger operators give a great deal of thought not only to using the best production practices

but also to selecting what they believe will be the most productive and profitable strains and crosses. In the last 10 years, the random sample egg-laying tests conducted in a number of States have been providing a valuable guide in this latter endeavor.

Random sample tests attempt to measure the genetic potential of the laying stock that would actually be purchased by commercial egg producers. The first step in the testing process is the random selection of hatching eggs. A sample is drawn from a group of representative eggs of each participating breeder. Next the eggs go to the central station where they are hatched. The different groups of pullet chicks are then saved, housed, fed and in other ways cared for essentially the same way. The test runs for a specified number of days, usually about 500 from the date of hatch. During the test, information on a number of economically important traits such as egg production per layer, mortality and egg size and quantity are compiled. Since the environmental conditions have been held the same for all entries, statistically significant differences in test results can be attributed to differences in inherited ability.

Egg production per layer over the last decade increased more in the South than in the other regions of the country because the egg industry in the South has been making a rapid transition from small farm flocks to large specialized commercial operations. Statistics from the Census of Agriculture show that between 1949 and 1959 the number of eggs sold per farms selling eggs increased almost 8-fold in the South Atlantic Region and 6-fold in the South Central Region, compared with only 2 to 4 fold increases for other areas of the country. Despite this rapid shift to large scale production, the size of operations in the South was still much smaller than those in the North Atlantic and Western States. (See table 25.) It is interesting to note that in the Midwest egg output per layer is now much higher than in the South Central Region even though the average egg sales on farms that market eggs are roughly the same in both regions. The reason for this is that in the South Central Region there are still a great number of very small laying flocks offset by some extremely large ones, whereas in the Midwest there is less variation in flock size. In many instances, no eggs are sold from farms with small flocks, which often have low rates of lay. In 1959, more than 90 percent of farms reporting chickens 4 months old and over in the South Central Region had flocks of less than 100 birds, compared with the Midwest where less than one-half of the flocks were this small.

Table 23.--Eggs sold per farm selling eggs, 1949, 1954, and 1959

Division	1949	1954	1959
	Dozen	Dozen	Dozen
North Atlantic	3,067	5,352	9,252
East North Central	994	1,323	2,346
West North Central	1,194	1,414	2,048
South Atlantic	462	1,099	3,644
South Central	312	516	1,960
Western	2,155	4,039	9,675
United States	995	1,576	3,112

Structural Changes in Egg Production and Marketing Help Explain Changes in Regional Prices

A comparison of egg prices received by producers among the various regions in any one year is of only limited usefulness because price differences depend on a number of factors, many of which are difficult to measure. These factors include: (1) the quality of eggs; (2) the use of egg; (3) distance from principal markets; (4) marketing services performed by the producer; and (5) average size of the production unit. However, when a longer period of time is considered, the impact of changes in these different factors can more readily be discerned.

In the period between 1947-49 and 1960 the average price received by U. S. producers declined 22 percent. Prices in all regions fell, but decreases were much more limited in the southern regions. Declines by regions were as follows: South Atlantic, 12 percent; South Central, 12 percent; North Atlantic, 23 percent; East North Central, 26 percent; West North Central, 28 percent; and Western, 30 percent.

The smaller declines in the South resulted principally from the rapid shift from small farm flocks to large commercial egg operations. This was accompanied by a more effective coordination of the production and marketing functions which not only reduced costs but greatly improved egg quality and therefore value. In the process more of the marketing functions were also transferred from specialized marketing agencies back to the farm, and this further enhanced the value of eggs sold. In addition, until recently a large part of the South's egg needs were supplied by other regions. This has helped to insulate egg prices in the South from the price-depressing effects of local increases in output. A factor in arresting the decline in egg prices in the South Atlantic Region was the increase in the production of broiler hatching eggs.

Table 24.--Egg production by regions: Percentage of United States total and index of change, 1947-49 average and annual, 1950-61

Year	Percentage of United States total						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
1947-49 average:	16.3	20.7	29.0	8.6	15.4	10.0	100.0
1950	17.2	19.9	28.3	8.8	14.9	10.9	100.0
1951	17.5	19.9	28.6	8.7	14.2	11.1	100.0
1952	18.3	19.7	27.6	8.8	14.3	11.3	100.0
1953	18.5	19.4	27.4	9.0	13.4	12.3	100.0
1954	18.4	19.6	27.8	9.0	12.6	12.6	100.0
1955	18.5	19.6	27.9	9.3	12.3	12.4	100.0
1956	18 5	19.6	27.0	9.8	12.8	12.3	100.0
1957	18.2	18.8	27.1	10.4	13.1	12.4	100.0
1958	17.7	18.8	26.6	10.8	13.3	12.8	100.0
1959	17.0	18.0	25.6	12.0	14.2	13.2	100.0
1960 1/	16.3	17.6	24.5	13.1	14.2	14.3	100.0
1961 1/	15.5	16.7	23.7	13.8	15.1	15.2	100.0
	Index of change (1947-49=100)						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
1947-49 average:	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1950	111.8	102.4	103.8	108.4	102.8	115.8	106.3
1951	112.1	100.7	103.1	106.9	96.5	115.7	104.7
1952	117.0	99.8	99.7	107.7	96.9	118.5	104.7
1953	118.3	98.0	98.6	109.3	90.4	128.3	104.4
1954	119.9	100.7	101.7	112.2	86.8	133.1	106.2
1955	121.3	101.9	103.1	116.6	86.0	132.3	107.3
1956	124.9	104.2	102.5	126.0	91.9	135.3	110.2
1957	122.3	99.9	102.9	133.1	93.6	136.6	110.0
1958	120.4	100.8	102.0	139.8	95.6	142.2	111.0
1959	118.9	99.4	100.6	160.2	105.5	150.2	114.2
1960 1/	110.3	94.1	93.7	169.0	102.4	157.2	110.6
1961 1/	105.1	89.2	90.4	177.2	108.2	167.3	110.4

1/ Preliminary.

Table 25.--Average egg production per layer by regions: Percentage of United States average and index of change, 1947-49 average and annual, 1950-61

Year	Percentage of United States average per layer						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
1947-49 average:	111.5	104.9	103.0	89.1	84.2	106.7	100.0
1950	108.6	102.9	101.7	90.8	85.1	108.6	100.0
1951	107.3	102.8	102.8	91.5	85.3	107.3	100.0
1952	108.3	103.3	101.7	91.2	86.2	107.7	100.0
1953	106.5	101.6	102.2	93.0	87.0	108.1	100.0
1954	104.8	101.1	101.1	94.1	85.6	109.0	100.0
1955	103.6	101.6	102.6	95.8	87.0	107.8	100.0
1956	102.5	101.5	101.0	96.4	88.3	108.1	100.0
1957	102.5	101.0	101.0	97.0	88.9	108.5	100.0
1958	101.5	102.0	102.0	96.5	89.1	108.9	100.0
1959	101.0	101.9	101.0	98.1	90.3	108.2	100.0
1960	100.5	101.9	101.0	99.0	90.4	106.2	100.0
1961	99.0	102.4	101.9	100.0	92.4	105.7	100.0
	Index of change (1947-49=100)						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
1947-49 average:	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1950	102.7	103.5	104.1	107.5	106.5	107.4	105.5
1951	103.3	105.2	107.1	110.2	108.6	108.0	107.3
1952	106.5	108.1	108.2	112.2	112.2	110.8	109.7
1953	107.1	108.7	111.2	117.0	115.8	113.6	112.1
1954	107.1	109.8	111.8	120.4	115.8	116.5	113.9
1955	108.2	112.7	115.9	125.2	120.1	117.6	116.4
1956	109.8	115.6	117.1	129.3	125.2	121.0	119.4
1957	110.9	116.2	118.2	131.3	127.3	122.7	120.6
1958	111.4	119.1	121.2	132.7	129.5	125.0	122.4
1959	113.6	122.0	122.9	138.1	134.5	127.3	125.5
1960	114.1	123.1	124.1	140.8	136.0	126.1	126.7
1961	113.0	124.3	125.9	142.9	139.6	126.1	127.3

Table 26.--Average price received by farmers for eggs by regions: Percentage of United States average and index of change, 1947-49 average and annual 1950-61

Year	Percentage of United States price per dozen						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
1947-49 average:	128.1	94.6	83.7	109.2	92.6	113.7	100.0
1950	132.0	92.6	80.2	112.4	91.5	113.5	100.0
1951	126.2	94.1	82.4	112.4	93.5	111.3	100.0
1952	128.1	92.6	78.1	116.6	94.0	112.7	100.0
1953	120.5	93.7	83.7	111.3	95.2	110.1	100.0
1954	126.5	91.8	77.1	123.0	101.1	107.1	100.0
1955	127.6	90.6	79.0	119.5	97.7	106.8	100.0
1956	123.7	92.6	80.2	120.1	101.0	103.1	100.0
1957	127.0	90.5	76.9	123.4	100.8	105.0	100.0
1958	123.4	90.9	78.2	124.2	104.7	101.6	100.0
1959	123.9	87.9	74.8	124.2	107.0	103.8	100.0
1960	125.0	89.2	76.4	121.9	103.3	101.1	100.0
	Index of change (1947-49=100)						
	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
1947-49 average	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1950	81.5	77.4	75.8	81.4	78.1	78.9	79.1
1951	102.4	103.5	102.3	107.0	104.9	101.7	103.9
1952	90.6	88.7	84.6	96.8	92.0	89.9	90.6
1953	97.8	103.0	103.9	106.0	106.8	100.6	103.9
1954	78.7	77.4	73.4	89.8	87.1	75.1	79.7
1955	85.7	82.5	81.3	94.2	90.8	80.8	86.1
1956	82.7	83.9	82.0	94.2	93.4	77.6	85.6
1957	77.6	74.9	71.9	88.4	85.2	72.2	78.2
1958	80.8	80.6	78.4	95.4	94.8	74.9	83.9
1959	66.2	63.6	61.2	77.8	79.1	62.5	68.4
1960	76.5	74.0	71.6	87.6	87.5	69.7	78.4

Table 27.--Egg production, total and per layer, by regions, 1947-49 average and annual, 1950-61

Year	Unit	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
				(a) Egg production				
1947-49 average:	Million	9,065	11,468	16,081	4,755	8,544	5,565	55,479
1950	do.	10,137	11,743	16,690	5,156	8,786	6,442	58,954
1951	do.	10,165	11,547	16,583	5,084	8,244	6,440	58,063
1952	do.	10,602	11,444	16,032	5,120	8,278	6,592	58,068
1953	do.	10,724	11,243	15,859	5,197	7,730	7,138	57,929
1954	do.	10,872	11,548	16,361	5,334	7,413	7,405	58,933
1955	do.	10,993	11,691	16,584	5,546	7,347	7,365	59,526
1956	do.	11,319	11,945	16,480	5,989	7,848	7,532	61,113
1957	do.	11,085	11,458	16,554	6,331	7,995	7,603	61,026
1958	do.	10,911	11,561	16,406	6,646	8,168	7,915	61,607
1959	do.	10,775	11,400	16,172	7,617	9,015	8,356	63,335
1960	do.	9,995	10,787	15,067	8,036	8,745	8,747	61,377
1961 2/	do.	9,523	10,224	14,545	8,427	9,242	9,313	61,274
				(b) Egg production per layer 1/				
1947-49 average:	Number	184	173	170	147	139	176	165
1950	do.	189	179	177	158	148	189	174
1951	do.	190	182	182	162	151	190	177
1952	do.	196	187	184	165	156	195	181
1953	do.	197	188	189	172	161	200	185
1954	do.	197	190	190	177	161	205	188
1955	do.	199	195	197	184	167	207	192
1956	do.	202	200	199	190	174	213	197
1957	do.	204	201	201	193	177	216	199
1958	do.	205	206	206	195	180	220	202
1959	do.	209	211	209	203	187	224	207
1960	do.	210	213	211	207	189	222	209
1961 2/	do.	208	215	214	209	194	222	210

1/ Number of eggs produced during the year divided by the average number of layers on hand during the year.
2/ Preliminary.

Table 28 .--Egg prices received by farmers, by regions, 1947-49 average and annual, 1950-60 1/

Year	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Weighted average: 1947-49 average:	58.8	43.4	38.4	50.1	42.5	52.2	45.9
1950	47.9	33.6	29.1	40.8	33.2	41.2	36.3
1951	60.2	44.9	39.3	53.6	44.6	53.1	47.7
1952	53.3	38.5	32.5	48.5	39.1	46.9	41.6
1953	57.5	44.7	39.9	53.1	45.4	52.5	47.7
1954	46.3	33.6	28.2	45.0	37.0	39.2	36.6
1955	50.4	35.8	31.2	47.2	38.6	42.2	39.5
1956	48.6	36.4	31.5	47.2	39.7	40.5	39.3
1957	45.6	32.5	27.6	44.3	36.2	37.7	35.9
1958	47.5	35.0	30.1	47.8	40.3	39.1	38.5
1959	38.9	27.6	23.5	39.0	33.6	32.6	31.4
1960 2/	45.0	32.1	27.5	43.9	37.2	36.4	36.0

1/ Average of all eggs sold by farmers including hatching eggs and eggs sold at retail by farmers.

2/ Preliminary.